

Japan: 300 tons of toxic water flowing into sea from Fukushima plant daily, radioactive hot spots found in seabed

Friday 16 August 2013, by [Associated Press](#), [Kyodo News](#), [Mainichi Shimbun](#), [OSAKI Tomohiro](#) (Date first published: 11 August 2013).

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300 tons of toxic water flowing into sea from Fukushima plant daily: gov't

TOKYO (Kyodo) — Around 300 tons of groundwater containing radioactive substances could be flowing from the crippled Fukushima Daiichi nuclear complex into the adjacent Pacific Ocean, the government said Wednesday in the latest revelation of how Japan is still struggling to contain the 2011 nuclear disaster.

Prime Minister Shinzo Abe vowed the same day that the government will firmly support Tokyo Electric Power Co.'s efforts to deal with the massive buildup of radioactive water at the plant, saying he cannot leave the matter up to the utility alone.

Radioactive water is increasing at the plant every day because groundwater is contaminated as it passes through the plant's premises, where three reactors have suffered meltdowns. TEPCO recently admitted that toxic groundwater is leaking into the ocean.

"We are assuming that there are three locations from where a total of 300 tons of contaminated groundwater is flowing into the ocean," an official of the Natural Resources and Energy Agency said.

The source of contamination is believed to be highly radioactive water left inside the so-called underground trenches that are connected to reactor buildings. Pipes and electric cables run inside the trenches.

The official said he does not know when leakage into the ocean started, but he noted that the government has not observed major contamination in areas of the sea outside the plant's enclosed harbor.

Apart from the 300 tons flowing into the ocean, around 400 tons of groundwater is known to be seeping into the Nos. 1 to 4 reactor buildings every day and getting mixed with toxic water that has

been used to cool the crippled reactors.

As emergency measures to prevent the toxic water from further flowing into the sea, TEPCO plans to pump up groundwater on the coast and harden the soil in some areas. But it is likely to be difficult to completely stem the leakage.

In the longer term, TEPCO plans to freeze the soil around the four reactor buildings to block groundwater from entering the buildings in the first place.

Chief Cabinet Secretary Yoshihide Suga told a press conference that the government needs to step in to financially assist the “unprecedented” plan to build a large water-shielding wall with frozen soil.

The Ministry of Economy, Trade and Industry is considering including the costs in its fiscal 2014 budget request, Suga added. If the request is approved, it will be the first government funding to help the plant operator tackle the problem of contaminated water.

To create frozen soil, pipes to run coolant will be inserted around the Nos. 1 to 4 reactor buildings. The wall is expected to be 1.4 kilometers long, possibly costing 30 billion to 40 billion yen.

The government has so far allocated taxpayer money for research and development related to reactor decommissioning at the Fukushima plant, crippled by a huge earthquake and tsunami on March 11, 2011.

The government also said Wednesday that it has finished reclassifying all 11 cities, towns and villages in Fukushima Prefecture that were designated as evacuation zones after the nuclear crisis, based on their radiation levels.

Under the new classification, the municipalities have been grouped into areas difficult to return to for at least six years after the accident, habitation-restricted zones, and areas preparing for evacuation orders to be lifted.

The government had expected to finish the reclassification work around March last year but consultations with local residents took time, an official of the Cabinet Office said.

Kyodo News, August 8, 2013

<http://mainichi.jp/english/english/newsselect/news/20130808p2g00m0dm037000c.html>

Radioactive hot spots found in seabed as far away as Miyagi

A research team led by the University of Tokyo has found more than 30 concentrations of radioactive cesium in the first full-fledged study of the isotope's accumulation on the seabed near the crippled Fukushima No. 1 nuclear plant, scientists said Wednesday.

The research, spearheaded by the university's Institute of Industrial Science, found that cesium-137, which has a half-life of 30 years, tends to get absorbed by clayish soil and concentrate in seabed depressions.

For example, a hot spot 70 meters wide was discovered 32 meters below the ocean surface 5.9 km from the plant.

The team said it found soil there containing radioactive cesium concentrations of 651 becquerels per kilogram.

The research, conducted from last August to July, covered the ocean within 20 km of the nuclear station. In the past scientists had only conducted sporadic samplings for cesium near the plant.

The team found relatively high levels of cesium-137 near the mouth of the Abukuma River in Miyagi Prefecture, 70 km north of the plant.

For example, 1.6 km east of the Abukuma River estuary, the research team found a hot spot with average concentrations of 1,029 becquerels per kilogram of mud. The river runs through both Fukushima and Miyagi prefectures, and the research team believes radioactive cesium was carried by the river to the hot spots in the sea.

It has also been reported that contractors doing decontamination work have dumped their debris in rivers.

Blair Thornton, a special associate professor at the university, told reporters that the findings will be shared with fishery researchers, who hope it will shed light on the possible effect of radioactive contamination on marine life.

Experts also hope the findings will lead to better contamination mechanisms and the ability to predict the movement of cesium-137 near coastal areas.

University of Tokyo professor Toyoji Kaneko, an expert on maritime creatures, said he doesn't believe all fish caught at or near the seafloor hot spots is dangerous to eat.

Fish swimming near the sea bottom may eat sand worms that have taken in mud contaminated with radioactive cesium, but fish eventually excrete most of the cesium and little would penetrate from the bowels into the muscle of the fish, Kaneko said.

"Although I can't guarantee 100 percent safety, it's not the like (meat from) fish will get immediately contaminated" with radioactive cesium, he said.

Thornton also said most of the cesium now detected in fish off Fukushima is believed to have come from tainted seawater near the plant, not from seabed mud.

National Maritime Research Institute of Tokyo and Kyushu Institute of Technology also participated in the survey.

Tomohiro Osaki, *Japan Times* Staff Writer, August 7, 2013

<http://www.japantimes.co.jp/news/2013/08/07/national/radioactive-hot-spots-found-in-seabed-as-far-away-as-miyagi/#.UgyObdgSrc>

Gov't mulls providing funds to block toxic water at Fukushima plant

TOKYO (Kyodo) — The government must step in to financially assist Tokyo Electric Power Co.'s efforts to prevent further accumulation of radioactive water at its crippled Fukushima Daiichi nuclear plant by freezing the soil around the reactor buildings, the top government spokesman said Wednesday.

"There is no precedent in the world to create a water-shielding wall with frozen soil on such a large scale (as planned now at the Fukushima complex). To build that, I think the state has to move a step further to support its realization," Chief Cabinet Secretary Yoshihide Suga told a press conference.

The Economy, Trade and Industry Ministry is considering including the costs in the fiscal 2014 budget request. If the request is approved, it will be the first government funding to help the plant operator tackle the problem of groundwater seeping to mix with contaminated water in the reactor buildings.

The government has so far allocated taxpayer money for research and development related to reactor decommissioning at the Fukushima plant, which suffered meltdowns in the aftermath of the massive earthquake and tsunami in March 2011.

To create frozen soil, pipes to run coolant will be inserted around the Nos. 1 to 4 reactor buildings, three of which house meltdown reactors. The wall is expected to be 1.4 kilometers long, possibly costing tens of billions of yen.

About 400 tons of groundwater seep into the reactor buildings every day and get mixed with toxic water that has been used to cool the crippled reactors. This means that the total volume of contaminated water is increasing by the same amount daily.

Most recently, the utility admitted that toxic water is escaping into the adjacent Pacific Ocean from the plant's site and it is trying to prevent the spread of contamination.

Kyodo News, August 7, 2013

<http://mainichi.jp/english/english/newsselect/news/20130807p2g00m0dm077000c.html>

TEPCO plans pump at Fukushima plant to combat radioactive water leak

Fukushima No. 1 nuclear plant operator Tokyo Electric Power Co. (TEPCO) plans to pump water out of the ground near the stricken plant's sea wall to try and prevent more radioactive water from seeping into the ocean, the utility announced on Aug. 5.

Groundwater contaminated with radioactive substances from the No. 1 plant's stricken reactors has likely been flowing into the ocean with the rise and fall of the tide. To counteract the seepage, the Nuclear Regulation Authority (NRA) ordered TEPCO on Aug. 2 to pump out groundwater before it reaches the waterfront.

TEPCO's pumping plans call for sinking a well on the site and pumping out some 100 metric tons of groundwater per day. The above-ground storage tanks for contaminated water are, however, already

almost full, and the utility is considering using the No. 2 reactor turbine building and other alternative sites to store the groundwater.

To prevent contaminated groundwater from reaching the ocean, TEPCO had already begun work on a subterranean wall made by applying sodium silicate — or “liquid glass” — to soil near the ocean, hardening it and creating a barrier. However, getting the wall all the way up to the last 1.8 meters beneath the surface is not technically feasible.

The NRA ordered the pumping operation after pointing out that TEPCO “should know that the measures now underway will not stop the leakage.”

The well for the pumping operation will be sunk on the inland side of the plant grounds. TEPCO also announced it will step up radiation monitoring in the plant harbor and the nearby sea to track the impact of the radioactive water leak.

Mainichi Shimbun, August 6, 2013

<http://mainichi.jp/english/english/newsselect/news/20130806p2a00m0na022000c.html>

Tokyo Electric can't stop radioactive flow at Fukushima plant

Tokyo Electric Power Co. said Tuesday it is struggling in its latest efforts to stop radioactive groundwater from flowing into the sea at the Fukushima No. 1 nuclear plant.

Tepco said some of the water is getting over or around “chemical walls” it created by injecting chemicals into the soil that solidify into a wall.

The latest problem involves groundwater that has built up over the last month, since Tepco started creating the chemical walls in an embankment to stop leaks after it detected radiation spikes in groundwater samples.

Tepco spokesman Yoshikazu Nagai said the company was slow to deal with the underground water problem while focusing on the melted reactors, which pose greater risks.

Measures to contain contaminated underground water leaks have lagged while “we devoted ourselves to cool the reactors,” which was the foremost task, Nagai said.

The plant still runs on makeshift equipment and has been plagued with blackouts and leaks from underground tanks.

Tepco has been repeatedly criticized for delayed handling and disclosures of problems and mishaps.

The Nuclear Regulation Authority set up a special panel with Tepco and met Friday to assess the water problem and discuss measures to resolve it. Watchdog officials have urged Tepco to pump the contaminated water inland and expand underground and seawater sampling. The utility is also building more layers of chemical walls around the embankment.

Officials acknowledged last month for the first time that the plant has been leaking radioactive water into the ocean for some time. After a major leak a month after the meltdowns, Tepco said it

had contained the problem, and denied further underground leaks into the ocean until recently, though many experts have suspected that from early on.

Data provided by Tepco showed underground water at coastal monitoring points has risen over the chemical wall, obviously leaking into the sea.

Associated Press, August 6, 2013

<http://www.japantimes.co.jp/news/2013/08/06/national/tokyo-electric-cant-stop-radioactive-flow-at-fukushima-plant/#.UgxDstgSrlc>

TEPCO begins pumping contaminated groundwater at damaged Fukushima plant

Tokyo Electric Power Co. (TEPCO) began pumping up contaminated groundwater on Aug. 9 from a well built near the No. 2 reactor of the crippled Fukushima No. 1 Nuclear Power Plant.

An estimated 300 tons of contaminated groundwater is leaking into the Pacific Ocean daily, and TEPCO is trying to reduce the amount of such water flowing into the sea. The Tokyo-based utility hopes to pump up a maximum 100 tons of contaminated water a day to be transported to the No. 2 reactor's turbine building.

In an effort to block water contaminated with radioactive substances at the Fukushima plant, TEPCO encased revetment ground in water glass in a wall-like formation. However, technical difficulties prevented the company from erecting a wall shallower than about 1.8 meters from the surface of the ground. As a result, the level of contaminated groundwater accumulating in the ground rose past the wall's upper edge — and subsequently began leaking into the ocean.

The Nuclear Regulation Authority ordered TEPCO on Aug. 2 to pump up contaminated groundwater at the Fukushima plant, which was rocked by the 2011 Great East Japan Earthquake and tsunami.

In order to pump up the contaminated groundwater, TEPCO dug a well of 2.5 meters in both depth and diameter inside the water glass wall in the ground. It also plans to drive about 30 tubes up to 3 meters deep into several locations near the well in order to pump up radioactive water. If these facilities are completed, TEPCO says, it will be able to pump up 100 tons of contaminated groundwater per day.

The government will allocate taxpayer money under the fiscal 2014 budget to deal with contaminated water. On Aug. 8, Economy, Trade and Industry Minister Toshimitsu Motegi ordered a government panel on contaminated water to consider releasing contaminated groundwater into the ocean.

Mainichi Shimbun, August 9, 2013

<http://mainichi.jp/english/english/newsselect/news/20130809p2a00m0na019000c.html>

Toxic water detected in newly built well at Fukushima nuclear plant

Tokyo Electric Power Co. said Sunday it has detected radioactive tritium in groundwater collected from a newly built observation well by the sea at the crippled Fukushima No. 1 nuclear power plant.

The groundwater sample collected Saturday from the well contained 34,000 becquerels of tritium per liter, up from 23,000 becquerels detected in a sample collected Thursday, a day after the well was installed some 4 meters away from the sea, the plant operator said.

The observation well was set up Wednesday about 4 meters north of the water intake for the No. 1 reactor.

Radioactive water is increasing at the Fukushima complex daily because groundwater is contaminated as it passes through the plant's premises, where three reactors experienced meltdowns following the March 2011 earthquake and tsunami disaster.

The utility suspects that groundwater has been contaminated at an underground trench by the sea that is connected to the No. 2 reactor building. The newly built well is located some 160 meters north of the trench.

Kyodo News, August 11, 2013

<http://www.japantimes.co.jp/news/2013/08/11/national/toxic-water-detected-in-newly-built-well-at-fukushima-nuclear-plant/#.Ugyms9gSrc>
